

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
Control No. (TCN) 08152 with Battelle Chapel Hill Operations for the U.S. Army Environmental Policy Institute

APRIL 2009 REPORT

Note to Readers: Pages 1-15 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 16.

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Item 1. International Response to Contain Influenza A(H1N1) Outbreak

The World Health Organization raised the level of influenza A(H1N1) alert to five on a one to six scale, meaning that it considers a pandemic highly probable. All countries are asked to activate their pandemic plans and be prepared to deal with emergency situations. The flu—a combination of swine, bird, and human viruses—started in Mexico and rapidly spread around the world, with cases confirmed in 11 countries, as of the end of April. WHO flu expert Dr Keiji Fukuda said, "Containment is not a feasible operation." In response to the outbreak, WHO has applied the International Health Regulations 2005 that entered into force in 2007 for all member states. Some experts consider that the influenza A(H1N1) will test IHR 2005's efficiency and countries' compliance, as well as provide an opportunity for increased preparedness for eventual future acts of bioterrorism and expedite research for a vaccine that would protect against a larger spectrum of viruses. The Saint Louis University Center for Vaccine Development announced that the development of a universal flu vaccine is getting closer to reality. [See also *Global Pandemic Containment Efforts* in October 2006 environmental security report.]

Military Implications:

In addition to monitoring the situation and protecting the health of military personnel and contractors, the military should follow this development to identify "lessons learned" for addressing future pandemics, help catalyze global efforts to strengthen implementation and compliance with IHR 2005, and improve contingency plans and training for possible future bioterrorist attacks.

Sources: (see a more expanded list in the [Appendix](#))

WHO influenza A(H1N1) information

<http://www.who.int/csr/disease/swineflu/en/index.html>

Disease and Terror

<http://www.newsweek.com/id/195422>

US military 'monitoring' flu outbreak

http://www.breitbart.com/article.php?id=CNG.8282347267271b64646e51f83dc4437f501&show_article=1

Universal Flu Vaccine in Development

<http://www.ens-newswire.com/ens/apr2009/2009-04-27-094.asp>

Item 2. UN to Conduct Post-Conflict Environmental Assessment in Gaza

UNEP's Post Conflict and Disaster Management Branch will deploy a team of up to eight experts to the Gaza Strip to assess the environmental impact of the December 2008–January 2009 invasion by Israel. The focus will be infrastructure and contamination risks assessment, wastewater and hazardous wastes management, state of coastal and marine environment examination, and institutional and economic evaluation. The ten-day mission is scheduled for mid-May, with results expected by early June, followed by a report and recommendations in July. [See also *Environmental Legacy of Hezbollah-Israeli War* in January 2007 environmental security report.]

Military Implications:

Military personnel in the region with environmental security responsibilities should explore liaison with the UNEP inspection team to identify modes of assistance and insights for improved

plans and training. Currently, post-conflict cleanups and mitigation are covered by some of the international community on an ad hoc basis. However, pressure is mounting for adopting regulations to include a comprehensive liability and mitigation regime based on the “polluter pays” principle, mainly concerning environmental damages in war, as well as for increased precision in attacks, to decrease environmental impact.

Source:

Assessment and Rehabilitation of Damaged Infrastructure Key Focus of UN Environment Chief's Mission to Gaza Strip

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=579&ArticleID=6132&l=en&t=long>

Item 3. Central Asian Water Security Tensions Continue

The Central Asian water summit held on April 28 at Almaty, Kazakhstan, gathered the Presidents of all five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan) to discuss activities of the International Fund for Saving the Aral Sea. When the contentious cross-border water sharing issues came up, tensions arose between upstream Kyrgyzstan and Tajikistan, who want to build power stations to address energy shortages in their countries, and downstream Kazakhstan, Turkmenistan, and Uzbekistan, which need large quantities of water for their economic activities. No agreement was reached and the final statement mentions only the issues related to the decline of the Aral Sea. Since the Soviet Union's cross-border water distribution system fell apart, the lack of a regional transboundary water management agreement became the most serious Central Asian security concern. Therefore, the international community should intensify such efforts as those started at the Fifth Ministerial Conference, “Environment for Europe”, held in Kiev in 2003 to develop a Central Asian Initiative on environment, water and security. [See also *Unless Water Management Improves, Conflicts over Water Are Inevitable* in August 2006, *A Project to Address the Aral Sea Disaster* in February 2005, *Network of Environment Centres in Central Asia* in February 2004, and *First EU-Central Asia Security Forum Included Environmental Security* in September 2008 environmental security reports.]

Military Implications:

If not already existing, a collective intelligence system might be created concerning strategic rivers around the world that have multi-country control and where conflicts are possible, allowing for continuous monitoring and potential conflict prevention strategies, so that lessons from one water security situation can be compared with others in providing early warning and strategic input to decision makers. NATO and other allied military forces, together with the Environment and Security (ENVSEC) Program and possibly OSCE, should intensify efforts for helping negotiations for design and implementation of a water management and cooperation framework in the region before tensions increase to a failure point.

Sources:

Central Asian Leaders Fail To Overcome Differences At Water Summit

http://www.rferl.org/content/Central_Asian_Leaders_Fail_To_Overcome_Differences_At_Water_Summit/1617787.html

Central Asia Water Talks Break Down

<http://www.moscowtimes.ru/article/1009/42/376690.htm>

Central Asia fails in water talks

<http://news.bbc.co.uk/2/hi/asia-pacific/8021900.stm>

Item 4. Regulations Might be Needed for New Greenhouse Gases

New findings show that some compounds developed to replace banned chemicals are powerful greenhouse gases contributing to global warming. The hydrofluorocarbons (HFCs) that replaced the ozone-depleting chlorofluorocarbons (CFCs) can be up to 10,000 times more powerful in climate-warming than CO₂. And, with their use growing at 8.8% per year, they might represent up to a third of all greenhouse gas emissions by 2030–2040. The Obama administration is considering proposing HFCs phase-out by an amendment to the Montreal Protocol or by creating a new international agreement. Similarly, sulfuryl fluoride, a fumigant introduced to replace methyl bromide, is a heat-trapping gas 4,800 times stronger than CO₂. Delegates at the Bonn climate change meeting targeted more than a dozen new synthetic compounds for inclusion in the post-Kyoto treaty as potent greenhouse gases. The list includes nitrogen trifluoride (NF₃)—used for LCD televisions, computer circuits, and thin-film solar cells—estimated to be an about 17,000 times more potent greenhouse gas than CO₂, and developed to replace perfluorocarbons (PFCs) covered by the Kyoto Protocol. [See more details in the [Appendix](#)]

Military Implications:

The military and its contractors should consider substitutes and also promote the phaseout of the compounds in question. Also, based on previous experience and in view of increased attention to environment and climate change, it is likely that new standards and more thorough research and scrutiny of new chemicals will be mandatory before introducing them into use.

Sources:

New Greenhouse Gas Identified

http://www.terraily.com/reports/New_Greenhouse_Gas_Identified_999.html

New greenhouse gas identified. Early detection may permit 'nipping it in the bud'

<http://web.mit.edu/newsoffice/2009/prinn-greenhouse-tt0311.html>

US wants to move on climate change

http://www.bostonherald.com/news/us_politics/view/2009_04_29_US_wants_to_move_on_climate_change

New greenhouse gases targeted by UN talks

http://www.spacedaily.com/reports/New_greenhouse_gases_targeted_by_UN_talks_999.html

Item 5. Rocket Launches Might Need Regulation to Safeguard Ozone Layer

Scientists warn that rapid growth of space activity requiring more rocket launches might lead to dangerously high levels of ozone-destroying emissions and therefore recommend adopting international regulations for rocket launches. One option would be to include the space industry in the Montreal Protocol that bans use of chlorofluorocarbons (CFCs) in aerosol cans, refrigerants and air conditioners. “If left unregulated, rocket launches by the year 2050 could result in more ozone destruction than was ever realized by CFCs,” said a team member, Professor Darin Toohey of the Atmospheric and Oceanic Sciences Department at the University of Colorado, Boulder. [See also *Call for Expanding Montreal Protocol on Ozone-Depleting Substances* in September 2007 environmental security report.]

Military Implications:

The military and its contractors should prepare to comply with eventual new rocket launch regulations and intensify R&D for replacing ozone-depleting CFCs. [Refer also to item *Regulations Might be Needed for New Greenhouse Gases* above.]

Source:

Scientists: Regulate Rocket Launches to Safeguard Ozone Layer
<http://www.ens-newswire.com/ens/apr2009/2009-04-01-091.asp>

Item 6. Technological Advances with Environmental Security Implications

6.1 Chemical Weapons-Resistant Chameleon Fabric to be Developed

Scientists at the Sandia National Laboratories in New Mexico are working on research that could lead to developing synthetic materials that would react to surrounding conditions—change color and temperature, and even “seal” upon contact with a hazardous chemical agent. Now that the theory is understood, they hope to get material results (mainly using nanotechnology) in five to ten years. “The long-term goal and payoff has a number of different applications, both in civilian applications as well as military ones,” said principal investigator George Bachand.

Military Implications:

In addition to its practical applicability, such a discovery would help reduce the general human and specifically military environmental footprint by reducing the number of different kinds of materiel required for operations. The military should follow and encourage the research for its potential military applicability, also keeping in mind the possible future need for environmental risk assessment of the new materials.

Sources:

US company envisions chameleon camouflage
http://www.smalltimes.com/news/display_news_story.cfm?NewsID=176913
 Sandia research points way toward chameleon-like camouflage
http://www.sandia.gov/news/resources/releases/2009/nano_camo.html

6.2 Waste Gasification Still a Controversial Technique

A recent article in *New Scientist* reviewed the current state of waste gasification and also noted objections being raised to that technology. According to the article, “Pilot gasification plants are being set up at various sites in the US, Canada, France, the UK and Portugal, most of them using the plasma technique. Japan already has two commercial plasma plants, but these are focused primarily on simply disposing of household waste rather than generating energy from it.” Plans for a large plant in Florida have been scaled down, and earlier plasma plants in Germany and Australia were shut down after failing to meet emissions standards. [See also *Mobile Unit Turns Waste into Energy* in February 2009 environmental security report.]

Military Implications:

The military should maintain its awareness of this technology for sparing the environment, and follow the course and evaluations (positive and negative) of the various techniques and projects, to determine possible applicability to military requirements.

Source:

Could your trashcan solve the energy crisis?

<http://www.newscientist.com/article/mg20227051.500-could-your-trashcan-solve-the-energy-crisis.html?page=1>

6.3 New Detection and Cleanup Techniques

6.3.1 Water Filter Effective Against Parasites

A new sand filter reportedly has the ability to clean water 30 to 50 times faster than similar existing devices, with the added advantage that it is effective in removing oocysts of the *Cryptosporidium* protozoan parasite from the flow. The filter, being developed by Prof. James Amburgey of the Department of Civil and Environmental Engineering at the University of North Carolina at Charlotte, uses a chemical pretreatment scheme based on ferric chloride and a pH buffer that is added to the water; a single formulation of the chemicals in the scheme seems to be effective regardless of water quality.

Military Implications:

The military should investigate the use of this technology in situations that require a simple, low-cost source of clean water.

Source:

Simple Filter Delivers Clean, Safe Drinking Water, Potentially To Millions

<http://www.sciencedaily.com/releases/2009/03/090309211938.htm>

6.3.2 Fast Multi-hazard Water Analyzer

A new automatic Biohazard Water Analyzer directly measures individual species of pathogenic bacteria, protozoa and viruses in the same test, and provides reports in two to three hours time. The technology is RNA-based, developed by Early Warning, Inc. of Troy NY and is licensed from NASA's Ames Research Center.

Military Implications:

The military should investigate this new system for its applicability to environmental assessment.

Sources:

Early Warning, Inc.

<http://www.earlywarninginc.com/>

Biohazard Water Analyzer Employs a Revolutionary Nanotechnology-Based Biosensor

<http://www.azonano.com/news.asp?newsID=10982>

6.4 Increasing Energy Efficiency Technologies

6.4.1 First Flexible Supercapacitor Built

Prof. George Grüner's group at UCLA has developed the world's first flexible supercapacitor by spraying carbon nanotubes onto plastic films that serve as both the device's electrodes and charge collectors. Their current designs are relatively inefficient, but the scientists believe that valuable insights are being obtained into the issues of manufacturing and material selection engineering.

Military Implications:

The military should follow this line of research as requirements increase for smaller and lighter electronic devices to be used in operational and environmental systems.

Source:

Printed supercapacitor could feed power-hungry gadgets

<http://www.newscientist.com/article/dn16939-printed-supercapacitor-could-feed-powerhungry-gadgets.html?DCMP=OTC-rss&nsref=online-news>

6.4.2 Hydrogen Production by Catalytic Light-induced Splitting of Water

Prof. David Milstein and colleagues in the Organic Chemistry Department of Israel's Weizmann Institute have carried out the first steps in the development of a new technique for catalytic production of hydrogen. The method depends on a series of thermal- and light-driven processes, aided by a recoverable ruthenium metal complex catalyst.

Military Implications:

The development might lead to practical technology for efficient production of hydrogen as an environmentally friendly fuel.

Source:

A Unique Approach for Splitting Water. Weizmann Institute Scientists Develop a Unique Approach for Splitting Water into Hydrogen and Oxygen

http://wis-wander.weizmann.ac.il/site/en/weizman.asp?pi=371&doc_id=5517

6.4.3 Diatoms Help Build Better Dye-sensitized Solar Cells

Researchers at Oregon State University and Portland State University have created a new way to make “dye-sensitized” solar cells, according to an announcement by chemical engineering Prof. Greg Rorrer at OSU. It turns out that diatom skeletons have an ideal nanostructure to serve as the basis for the semiconductors for a dye-sensitized solar cell. The skeletons may have come from diatoms raised in an environment containing titanium rather than silicon, so that they actually consist of titanium dioxide, or they may be normal skeletons that have been “frosted” with the titanium material. In either case, the physical “shape” of the diatom film is such that a solar cell made with these semiconductors is more efficient at converting incident light into energy.

Military Implications:

The military should follow this research as it progresses into commercial availability for use in operational and environmental systems.

Source:

Ancient diatoms lead to new technology for solar energy

http://www.eurekalert.org/pub_releases/2009-04/osu-ad1040809.php

6.4.4 Genetically Engineered Viruses Produce Advanced Battery Electrodes

Profs. Angela Belcher, Gerbrand Ceder, and Michael Strano of MIT have developed the first devices that use a potentially fast and inexpensive technology in which battery anodes and cathodes are “grown” by a genetically engineered bacteriophage that accumulates conductive materials on a polymer separator. The researchers are now working on up- and down-sizing the components, and improving their rechargeability life.

Military Implications:

The military should track this line of development as it proceeds toward practical applicability for use in power supplies for environmental sensing and repair systems and for operational devices.

Source:

Virus battery could 'power cars'

<http://news.bbc.co.uk/2/hi/technology/7977585.stm>

Item 7. Updates on Previously Identified Issues

7.1 Airline Group Supports Including Aviation in Global Emissions Trading Scheme

An aviation group expressed support for a global emissions-trading scheme and hopes that their proposal will be included in the new post-Kyoto pact to fight climate change. The 43-point proposal covers all carbon pollution from the international aviation sector, suggesting a framework for allowances and the creation of a UN body for administering the system, and recommending that nations agree to a global cap on aviation emissions. The six-member group includes four of the world's top airlines (Air France/KLM, British Airways, Cathay Pacific, Virgin Atlantic), airport operator BAA, and the international NGO, The Climate Group. [See also *Provisional Agreement for Including Aviation in the Emission Trading Scheme from 2012* in June 2008 environmental security report.]

Military Implications:

[Similar to previous on this issue] It is not clear at this point if the proposals for including the aviation industry in the global emissions-trading scheme concern only commercial and private flights, or all. The military should explore possible impacts on its operations and consult with allied military forces on the status of military exemptions.

Source:

Airline group backs global emissions trading scheme

<http://uk.reuters.com/article/governmentFilingsNews/idUKSP41096120090406>

7.2 U.S. and Canada to Control Air Emissions from Ships

The U.S. and Canada have proposed that the International Maritime Organization create a North American Emission Control Area around their coastlines, extending out 200 nautical miles in the jurisdictions of the United States and Canada. In order to comply with the new standards, ships should use fuel with a maximum of 1,000 parts per million sulfur beginning in 2015, and new ships should use advanced emission control technologies beginning in 2016. The proposal is part of a comprehensive EPA program to address harmful emissions from ships under the National Clean Diesel Campaign and the Clean Ports Program, in an effort to protect the population from harmful emissions. The IMO is expected to begin reviewing the proposal in July, with expected approval in 2010. [See also *Tougher Global Limits Imposed on Air Pollution from Large Ships* in October 2008 environmental security report.]

Military Implications:

[Same as previous on similar issues] The military should be prepared to comply with new international anti-pollution regulations that may not exempt military craft. Transportation contract managers will need to prepare for these changes, with respect to bidder selection.

Sources:

US and Canada Request IMO Create Emissions Control Area Around Coastlines

<http://www.greencarcongress.com/2009/03/us-and-canada-request-imo-create-emissions-control-area-around-coastlines.html>

U.S., Canada Seek to Control Air Emissions from Ships

<http://www.ens-newswire.com/ens/mar2009/2009-03-30-02.asp>

7.3 European Climate and Energy Package Formally Adopted

The European 20/20/20 energy and climate package was formally adopted, setting legally binding targets requiring that by 2020 greenhouse gas emissions be cut to 20% below 1990 levels, the share of renewable energy increase to 20%, and energy efficiency improve by 20%. The package consists of six legislative acts and will enter into force 20 days after publication in the Official Journal, expected in May 2009. [See also *EU Renewable Energy Policy becomes Legally Binding* in December 2008 and other related items in previous environmental security reports.]

Military Implications:

[Same as previous on this issue] Military stationed in EU member states should review their actions to support the EU 20/20/20 energy policy and seek opportunities to apply the Army Strategy for the Environment.

Sources:

Commission welcomes adoption of climate and energy package

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/628&format=HTML&aged=0&language=EN&guiLanguage=en>

7.4 Norway Proposal to Ban Gasoline-only New Cars by 2015

Norway Finance Minister Kristin Halvorsen wants to put forward a proposal to ban from 2015 the sale in Norway of new cars that run solely on fossil fuels. The proposal's intent is to force carmakers to shift to greener models, to help cut greenhouse gas emissions. [See also *European Commission Proposed Binding Legislation for Vehicle Emissions Cuts* in December 2007 and *All-Electric cars coming from Norway and China with More than Hundred Mile Ranges* in April 2008 environmental security reports.]

Military Implications:

Although applying only to specific countries or regions, such regulations create a precedent and set standards that may eventually expand and may also apply to vehicles from outside but operating in the respective areas. The military should review its current and future procurements in light of the new regulations.

Source:

Ban Gasoline Cars from 2015: Norway Finance Minister

<http://planetark.org/wen/52660>

7.5 Canada Increases Chemicals Control

Ontario has joined Quebec in enacting restrictions on the use of pesticides and is going further by prohibiting the sale and cosmetic use of more than 80 ingredients and 250 products. Other

provinces are considering similar measures. Ontario also proposed the Toxics Reduction Act, 2009, aiming to reduce the use of toxic and hazardous substances in manufacturing and industrial operations. If enacted, the directive will bring Ontario manufacturing into compliance with the EU REACH regulations. [See also *Canada Extends Toxic Substances Lists* in March 2009 and *New Chemicals Considered for Toxic Lists* in January 2009 environmental security reports.]

Military Implications:

[Same as previous on similar issues] The military should review its use of these chemicals, if any, in anticipation of probable future regulatory actions by Canada and other jurisdictions.

Sources:

Ontario to enact toughest pesticide ban in Canada

<http://www.thestar.com/News/Ontario/article/621989>

Ontario Proposes Industry Detox Legislation

<http://www.ens-newswire.com/ens/apr2009/2009-04-08-02.asp>

Toxics Reduction Act, 2009

<http://www.ebr.gov.on.ca/ERS-WEB-External/displaynoticecontent.do?noticeId=MTA2MTQ5&statusId=MTU5MTk4&language=en>

7.6 New Developments Concerning the Arctic

The declaration adopted by the Arctic Council ministerial meeting held in Tromsø, Norway, April 28-29, represents a comprehensive instrument for international cooperation and policies in the region. Some of the most significant issues are: negotiation of an international instrument for cooperation on search and rescue services; a demand for the IMO to develop new guidelines for ships operating in Arctic waters and mandatory regulations on safety and environmental protection in the region; development of standards and guidelines for economic activities and oil and gas exploration in the Arctic; creation of a task force on short-lived non-CO₂ drivers of climate change such as black carbon, methane and tropospheric precursors in Arctic climate change; ecosystems-based ocean management; and addressing effects of climate change on indigenous people and ecosystems. Russia said that it opposes the presence of any military-political blocs in the Arctic and invited support for its new initiative “The Electronic Memory of the Arctic,” an open access on-line information resource. The request of the EU, China, Italy, and South Korea for permanent observers’ status was put on hold for now. The next ministerial meeting of the Arctic Council will be in 2011, although, given the increasing importance of the Arctic, meetings at political level will be held yearly. Denmark will take over the chairmanship of the Arctic Council.

Canada announced the location of the two satellite reception ground stations for the Polar Epsilon project designed to enhance its Arctic surveillance and security capabilities and capacity to exploit space-based data for defense, maritime security and environmental monitoring.

Norway became the first Arctic nation to accept limits to its northern seabed with the new defined continental shelf at 550 kms (342 miles) from the Pole, which is claimed by both Russia and Denmark. [See also *Arctic Security and Sovereignty Debate Continues* in January 2009, *Arctic Needs New International Regulations* in September 2008 and other items on the Arctic debate in previous environmental security reports.]

Military Implications:

[Similar to previous on this issue] Negotiations for clear international regulations concerning the Arctic region are necessary to continue to reduce potential conflicts, and define new military

roles in the region for both national security and protection of the ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations for developing adequate strategies, regulations, and enforcement procedures.

Sources: (a more expanded list in the [Appendix](#))

The Tromsø Declaration ratified

http://arctic-council.org/article/2009/4/the_tromso_declaration_ratified

Russia does not view Arctic as area of potential conflicts – Lavrov

<http://www.interfax.com/3/490967/news.aspx>

Government of Canada Announces Location of Satellite Reception Ground Stations for Polar Epsilon

<http://www.marketwire.com/press-release/Department-Of-National-Defence-967526.html>

Oslo sets limit on Arctic seabed, short of North Pole

<http://www.reuters.com/article/environmentNews/idUSTRE53E3X420090415>

7.7 Fiber Check Dams with Chemicals Control Polluting Construction Runoff

Research by Dr. Rich McLaughlin, associate professor of soil science at NC State Univ., and colleagues has shown that fiber check dams constructed from a mix of straw wattles and coir logs, with added granulated, anionic polyacrylamide (PAM), are enormously more effective in protecting watercourses from the muddy runoff around road and other construction projects than the currently used "sediment traps" and rock check dams in ditches. Turbidity of road runoff improved by a factor of more than 100.

Military Implications:

The military should investigate this technology for reducing the environmental damage from construction projects and training.

Sources:

Improving construction site runoff quality with fiber check dams and polyacrylamide

<http://www.jswnonline.org/content/64/2/144.abstract>

Study finds better way to protect streams from construction runoff

<http://www.physorg.com/print159190208.html>

7.8 Possibly Tainted Imported Drywall Raises Health Fears

A number of complaints from around the US have alerted authorities to possible health and other problems allegedly caused by imported Chinese drywall. It appears that a large but unknown quantity of this product may contain, or have been contaminated with, chemicals that over time emit noxious fumes.

Military Implications:

The military should track the federal (Consumer Product Safety Commission) and state investigations into this possible problem and be prepared to assess its impact on military facilities and projects (past, ongoing and planned), if necessary.

Source:

AP IMPACT: Chinese drywall poses potential risks

http://www.denverpost.com/business/ci_12122912

7.9 Climate Change

7.9.1 Scientific Evidences and Natural Disasters

A poll conducted by Reuters with experts, who were among authors of the 2007 IPCC report, attending the Bonn Climate Change meeting revealed high agreement that it is “unlikely” (less than 1/3 chance) the world would manage to limit warming to 2°C (3.6°F) above pre-industrial levels. Out of 11 scientists participating in the survey, 6 said world average annual temperatures would set a new record by 2015, and 4 said it would happen by 2020. As for sea level rise by 2100, projections varied from 30-40 cm (11.8–15.7 inches) to up to 140 cm (55.1 inches), and 10 of those polled projected that Arctic late summer sea ice could vanish before 2050, with two saying it would happen by 2020. A similar poll conducted by the Guardian with participation of 261 experts showed that 46% of those who answered the question on temperature rise estimated that it would reach 3–4°C (5.4–7.2°F) by the end of the century.

The *Right to Survive* report by Oxfam International reveals that the number of people affected by the 6,500 climate-related disasters recorded since 1980 has doubled in 30 years and estimates that by 2015 it might further increase by 54%, to an average of more than 375 million people per year. The emergency organizations might be overwhelmed by the rising number of people in poor countries affected by climate hazards, while worldwide emergency aid spending would need to be doubled to at least \$25bn a year to help cope with the situation.

7.9.2 Food and Water Security

The First G8 Agriculture Ministers’ Meeting, held in Cison di Valmarino, Italy, April 18–20, under the theme “The World Food Emergency,” was attended by Ministers of Agriculture of the G8 countries and Brazil, China, India, Mexico, South Africa, Argentina, Australia and Egypt, and the heads of UN agencies. The Declaration adopted includes proposals to place agriculture and food security at the core of the international agenda and sustainably increase renewable energy production from biomass without compromising food security. The Declaration will be forwarded to the G8 Heads of State summit to be held in Italy in July 2009.

Delegates attending the 65th Session of the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) held in Bangkok, Thailand, April 23-29, discussed the financial crisis and its convergence with other threats to development and the need to work toward a stable and supportive financial system for development. The meeting was convened under the theme of “Sustainable Agriculture and Food Security in Asia and the Pacific” with the special body on least developed and land locked developing countries addressing the food-fuel-financial crisis and climate change, and associated threats to development.

Rivers in some of the world’s most populated regions are losing water due largely to climate change, reveals research led by scientists from the National Center for Atmospheric Research (NCAR) in Boulder, Colo., to be published May 15 in the American Meteorological Society's *Journal of Climate*. Among the 925 big rivers, rivers with decreased flow outnumbered those with increased flow by 2.5 to 1 and freshwater discharges into the Pacific Ocean and Indian Ocean dropped by 6% and 3% respectively over the past 50 years (from 1948 to 2004). Added to the effects from damming, irrigation, and other water use, these changes could become a threat to future supplies of food and water, warn the researchers.

The “Asia's Next Challenge: Securing the Region's Water Future” report produced by the Asia Society, warns that Asia may see more conflicts over scarce water resources in the coming years due to the combination of climate change, urbanization, and population growth. Most vulnerable are the relations between India and Pakistan, and those related to the Mekong River,

which is shared by China and its southern neighbors, Myanmar, Laos, Thailand, Cambodia and Vietnam. The ten recommendations put forward in the report include greater regional cooperation and ensuring that water management organizations work directly with those responsible for defense and diplomacy.

7.9.3 Melting Glaciers and Sea Ice

Recent evidence of ice loss from both poles renewed the fears that global warming is progressing faster than scientists predicted. The latest evidence from satellite observations from NASA and the National Snow and Ice Data Center show that the decade-long trend of shrinking sea ice cover is continuing, and the ice cap is thinning. Compared to the 1980s and '90s, thicker ice, which lasts two summers or more, decreased to less than 10% of the northern polar ice cap in winter, from 30–40% (and 20% just two years ago), while thinner seasonal sea ice (which melts in summer) now accounts for about 70% of the Arctic total, compared to 40–50%. Similar observations were made by Pen Hadow, the head of a British team walking to the North Pole to assess the Arctic ice sheets melting rate, who found that, so far, the average depth of the ice has been under 1.8 meters (6 feet), suggesting most is new first-year ice that is likely to melt in summer months.

Similar phenomena are happening at the South Pole, where the European Space Agency satellite data show massive amounts of ice are breaking away from the Wilkins Ice Shelf on the western side of the Antarctic Peninsula.

7.9.4 Health

At the ceremony on World Health Day, April 7, Michel Jerraud, Secretary-General of WMO, noted the need for early warning systems for climate hazards. Margaret Chan, Director-General of WHO, discussed the need for long-term planning, especially for those areas that will become disaster-prone due to climate change, and also made connections between climate change and needs to ensure disaster-related health care.

7.9.5 Adaptation

The European Commission presented a White Paper outlining the framework for reducing the European Union's vulnerability to the impacts of climate change. Since the impacts of climate change vary by region, the strategy would complement Member States' policies through an integrated and coordinated approach, particularly in cross-border issues. It underlines that adapting to climate change should be integrated into all EU policies. The plan has two phases: the first one spans 2009-2012 for preparing the knowledge base and policy instruments for phase two, commencing in 2013, that would be the implementation of the adaptation strategy. The White Paper covers phase 1, which is based on "four pillars of action" covering increasing understanding of climate change and identifying actions and policy instruments to be embedded in key EU policies. The paper specifies that a Clearing House Mechanism should be established by 2011 to exchange information on climate change impacts and adaptability measures. The Commission will set up an Impact and Adaptation Steering Group to ensure the successful completion of phase 1. The Commission also presented three discussion papers on water, coasts and marine, and agricultural and health issues based on the framework set out in the White Paper.

UN Deputy Secretary-General Asha-Rose Migiro highlighted links between the issues of gender, disaster risk reduction, climate change, and poverty reduction in a statement delivered to

the International Conference on Gender and Disaster Risk Reduction, from 20-22 April, in Beijing, China. Migiro stressed that women, who constitute 70% of the world's poor, are disproportionately impacted by disasters and warned that climate change is expected to exacerbate this suffering, as well as threaten food security, health, and water supplies. She called for a "21st Century multi-stakeholder partnership" to mitigate the growing scourge of disasters.

Nearly 500 indigenous representatives from 5,000 distinct indigenous groups across 80 nations gathered for the Indigenous People's Global Summit on Climate Change, hosted by the Inuit Circumpolar Council, April 20-24, in Anchorage, Alaska, to discuss how to integrate indigenous views, policies, traditional values and visions into the global response to the challenges of climate change. The Summit's final recommendations contain two options regarding the use of fossil fuels: the first calls for a moratorium on new oil and gas drilling, while the second proposes an eventual phase-out of fossil fuels use, while at the same time respecting the rights of indigenous people to develop their resources. The recommendations will be presented to COP15.

7.9.6 Post-Kyoto Negotiations

The first of three sessions preparing for the Copenhagen conference, held March 29-April 8 in Bonn, Germany, was attended by more than 2,000 delegates from government, business and industry, environmental organizations, and research institutions. While progress was made on many issues, mainly related to technology cooperation between industrialized and developing countries and deforestation, the deadlock concerning rapidly developing countries—such as India and China—in mandatory reductions framework continues. Meantime, an alliance of 43 island states, backed by more than a dozen nations from Africa and Latin America, urged developed countries to cut greenhouse emissions by at least 45% below 1990 levels by 2020, and by at least 95% below 1990 levels by 2050. Countries have the opportunity to provide input to the draft for the negotiating text ahead of the next round of talks to be held in June.

Military Implications:

[Same as previous on this issue] The military should identify all its resources and programs for reducing GHGs and responding to effects of climate change, update information continuously, forecast how it might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. International discourse over climate change increases the rate of emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects.

Sources: (see a more expanded list in the [Appendix](#))

World will not meet 2C warming target, climate change experts agree

<http://www.guardian.co.uk/environment/2009/apr/14/global-warming-target-2c>

Right to Survive

<http://www.oxfam.org/en/policy/right-to-survive-report>

The First G8 Agriculture Minister's Meeting

<http://www.g8agricultureministersmeeting.mipaaf.com/en/>

As World Warms, Water Levels Dropping In Major Rivers

<http://www.sciencedaily.com/releases/2009/04/090421101625.htm>

Asia's Next Challenge: Securing the Region's Water Future

<http://www.asiasociety.org/taskforces/water/>

Lack Of Permanent Arctic Ice Surprises Explorers

<http://planetark.org/wen/52513>

Satellite imagery shows fragile Wilkins Ice Shelf destabilized

http://www.esa.int/esaCP/SEMRAVANJTF_index_0.html

World Health Day

<http://www.who.int/world-health-day/2009/en/index.html>

Living with climate change in Europe

http://ec.europa.eu/environment/climat/adaptation/index_en.htm

Latest round of UN talks on pact to combat global warming wraps up in Bonn

<http://www.un.org/apps/news/story.asp?NewsID=30433&Cr=climate&Cr1=change>

China, India reject climate agreement that obstructs economic growth

<http://mangalorean.com/news.php?newstype=local&newsid=119511>

7.10 Nanotechnology Safety Issues

More detailed descriptions of the following nanotechnology issues are in the [Appendix](#)

- the European Parliament has forwarded to the European Commission a resolution asking for stronger nanotech precautions ([more](#))
- OECD report *Preliminary Analysis of Exposure Measurement and Exposure Mitigation in Occupational Settings: Manufactured Nanomaterials*, “provides researchers with suggestions on how to respond to the lack of standards on techniques for measuring workplace exposure to nanomaterials.” ([more](#))
- SAFENANO publishes first global review of EHS risks of nanotechnology ([more](#))
- China Moves Strongly into Nanotech Arena ([more](#))
- New Comparison of Micro- and Nano-particles’ Toxicity to Cells ([more](#))
- ‘Nanotechnology, Risk and Communication’ study on media coverage, policy debates and public perceptions about nanotechnology ([more](#))
- The 1st EU International Cooperation Partner Countries (ICPC) NanoNet Workshop will be held on June 1st at the same venue as EuroNanoForum 2009 ([more](#))

Military Implications:

[Same as previous on this issue] Relevant military personnel should review the information generated by such activities to improve military and contractor practices, as well as to assist and cooperate with the organizations working on those issues for enriching their studies.

Sources:

EU Parliament wants tighter nano regulation

<http://euobserver.com/9/28015/?rk=1>

Preliminary Analysis of Exposure Measurement and Exposure Mitigation in Occupational Settings: Manufactured Nanomaterials, report

[http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT000029E6/\\$FILE/JT03263204.PDF](http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT000029E6/$FILE/JT03263204.PDF)

EMERGNANO: A review of completed and near completed environment, health and safety research on nanomaterials and nanotechnology report

http://www.safenano.org/Uploads/EMERGNANO_CB0409_Full.pdf

China's giant step into nanotech

<http://www.guardian.co.uk/technology/2009/mar/26/nanotechnology-china>

Size matters. Comparing the toxicity of micro- to nanoparticles

<http://www.nanowerk.com/spotlight/spotid=10128.php>

Nanotechnology, Risk and Communication

<http://www.palgrave.com/products/title.aspx?PID=277172>

1st ICPC NanoNet Workshop

<http://www.icpc-nanonet.org/content/category/6/40/91/>

Item 8. Reports and Information Suggested for Review

8.1 Wearable Computing Show Scheduled in Milan 20 May 2009

The Road Show *wearIT@work: The Present and the Future of Wearable Computing - Application in real-life work environments* will take place on 20 May 2009 at the HP Milano site in Cernusco sul Naviglio, Milan, Italy. wearIT@work is an Integrated EU FP6 Project and is the largest project worldwide in Wearable Computing. Its major goal is the development and integration of wearable computing as a way of bringing computer support to workers without interfering with their normal activities.

Military Implications:

Appropriate military personnel in the area should consider attending this show to further explore the possible use of wearable computing systems in training, operations, and environmental surveillance.

Sources:

wearIT@work Road Show - 20 May 2009, Milan

<http://www.wearitatwork.com/Road-Show-Milan-20-May-2009.321.0.html>

wearIT@work project

<http://www.wearitatwork.com/>

8.2 Solar Storm Could Wipe Out Power Grid

A recent article in *New Scientist*, sparked by a report from the National Academies, calls attention to the grave danger to the electronic environment posed by a very large “coronal mass ejection” – a solar storm, one of which, although admittedly extremely rare (the worst one so far was in 1859), could effectively destroy the electricity grid over a large section of the US. Magnetospheric effects from the coronal plasma ball would induce large DC currents in the high-voltage grid, melting transformers and leading to a national disaster of unimaginable proportions.

Military Implications:

The military should ensure that it is exerting maximum effort, in cooperation with other agencies, to aid in the establishment of an adequate international early warning system to protect against such a low-probability-enormous-impact environmental catastrophe, and in setting up facilities and procedures to handle such a situation.

Sources:

Severe Space Weather Events--Understanding Societal and Economic Impacts: A Workshop Report

http://www.nap.edu/catalog.php?record_id=12507#top

Space storm alert: 90 seconds from catastrophe

<http://www.newscientist.com/article/mg20127001.300-space-storm-alert-90-seconds-from-catastrophe.html?full=true>

APPENDIX

Reference Details

This Appendix contains expanded background information on some items.

Item 1. International Response to Contain Influenza A(H1N1) Outbreak

Sources: (see a more expanded list)

WHO influenza A(H1N1) information

<http://www.who.int/csr/disease/swineflu/en/index.html>

Disease and Terror. The swine-flu outbreak caught health officials completely by surprise—just as a bioterror attack would.

<http://www.newsweek.com/id/195422>

US military 'monitoring' flu outbreak

http://www.breitbart.com/article.php?id=CNG.8282347267271b64646e51f83dc4437f.501&show_article=1

Universal Flu Vaccine in Development

<http://www.ens-newswire.com/ens/apr2009/2009-04-27-094.asp>

France calls for EU Mexico travel ban as swine flu alert level raised

<http://euobserver.com/9/28041/?rk=1>

UN notches up swine flu pandemic alert to level 5

<http://www.un.org/apps/news/story.asp?NewsID=30638&Cr=swine&Cr1=>

World Health Organization Raises Swine Flu Alert Level

http://www.nytimes.com/2009/04/30/health/30flu.html?_r=1&th&emc=th

WHO, Swine influenza

http://www.who.int/mediacentre/news/statements/2009/h1n1_20090427/en/index.html

WHO raises swine flu alert level

<http://news.bbc.co.uk/2/hi/americas/8021827.stm>

The Swine Flu Outbreak and International Law

http://campaign.constantcontact.com/render?v=001as_XC_VpxF7CLyZ2X2VYRs4rysOEo2iRtEdqHxcq-NWos8DsYAt3JSbED7uyNYcCEWto0Zr-E4_NOyrIXOOfl5XzUQWefQhVchT2DcLfQZ9q5XaS69T6owS9btggXSXycRM0QJbWZs4626V_86G2g%3D%3D

World Animal Health Body Says Swine Flu Wrong Name

<http://planetark.org/wen/52643>

International unity key to tackling swine flu threat, Ban says

<http://www.un.org/apps/news/story.asp?NewsID=30609&Cr=virus&Cr1=>

France calls for EU Mexico travel ban as swine flu alert level raised

<http://euobserver.com/9/28041/?rk=1>

Item 4. Regulations Might be Needed for New Greenhouse Gases (a more detailed version)

New findings show that two gases, hydrofluorocarbons and sulfuryl fluoride, which replace ozone-depleting chemicals banned under the Montreal Protocol, are powerful greenhouse gases contributing to global warming. The HFCs (now regulated by the Kyoto Protocol), which

replaced the ozone-depleting chlorofluorocarbons (CFCs) can be up to 10,000 times more powerful climate-warming chemicals than CO₂, shows U.S. government data. HFCs use is growing at 8.8% per year and under some CO₂-reduction scenarios, it might represent up to a third of all greenhouse gas emissions by some time in the period 2030–2040. The Obama administration is considering proposing HFCs phaseout by an amendment to the Montreal Protocol or by creating a new international agreement. The proposal might be submitted for consideration at the next meeting of the parties to the Montreal Protocol in November. Meantime, the EPA might ban HFCs under the Clean Air Act, due to threat to human health and welfare.

Similarly, an international team of scientists discovered that sulfuryl fluoride, a fumigant introduced to replace methyl bromide, is a heat-trapping gas 4,800 times stronger than CO₂. The gas has a maximum lifespan of 36 years, and is not yet produced in large quantities, although increasing by about 5% per year. The finding was made through the NASA-sponsored Advanced Global Atmospheric Gases Experiment program.

Delegates at the Bonn Climate Change Talks also targeted more than a dozen new synthetic compounds for inclusion in the post-Kyoto treaty as potent greenhouse gases. The list includes nitrogen trifluoride (NF₃)—used for LCD televisions, computer circuits, and thin-film solar cells—estimated to be an about 17,000 times more potent greenhouse gas than CO₂, and which was developed to replace perfluorocarbons (PFCs), covered by the 1997 Kyoto Protocol. Other chemicals under review include new types of PFCs and HFCs, trifluoromethyl sulphur pentafluoride (SF₅CF₃), fluorinated ethers, perfluoropolyethers and hydrocarbons, and some other compounds: dimethylether (CH₃OCH₃), methyl chloroform (CH₃CCl₃), methylene chloride (CH₂Cl₂), methyl chloride (CH₃Cl), dibromomethane (CH₂Br₂), bromodifluoromethane (CHBrF₂) and trifluoroiodomethane (CF₃I).

Military Implications:

The military and its contractors using hydrofluorocarbons and sulfuryl fluoride should consider substitutes and also promote their phase-out in regions where they are stationed. Also, in view of increased attention to the environment and climate change, it is likely that more thorough research and scrutiny of chemicals will be mandatory before introducing them into use.

Sources:

New Greenhouse Gas Identified

http://www.terraily.com/reports/New_Greenhouse_Gas_Identified_999.html

New greenhouse gas identified. Early detection may permit 'nipping it in the bud'

<http://web.mit.edu/newsoffice/2009/prinn-greenhouse-tt0311.html>

US wants to move on climate change

http://www.bostonherald.com/news/us_politics/view/2009_04_29_US_wants_to_move_on_climate_change

New greenhouse gases targeted by UN talks

http://www.spacedaily.com/reports/New_greenhouse_gases_targeted_by_UN_talks_999.html

Item 7. Updates on Previously Identified Issues

7.6 New Developments Concerning the Arctic

Sources: (an expanded list)

The Tromsø Declaration ratified

http://arctic-council.org/article/2009/4/the_tromso_declaration_ratified

Arctic Council rejects EU's observer application

<http://euobserver.com/9/28043/?rk=1>

Oslo sets limit on Arctic seabed, short of North Pole

<http://www.reuters.com/article/environmentNews/idUSTRE53E3X420090415>

"Plenty Of Opportunities" From Arctic Thaw - Norway

<http://planetark.org/wen/52632>

Government of Canada Announces Location of Satellite Reception Ground Stations for Polar Epsilon

<http://www.marketwire.com/press-release/Department-Of-National-Defence-967526.html>

Arctic: competition or cooperation?

<http://www.ruvr.ru/main.php?lng=eng&q=44085&cid=57&p=21.04.2009>

Russia does not view Arctic as area of potential conflicts – Lavrov

<http://www.interfax.com/3/490967/news.aspx>

7.9 Climate Change

Sources: (an expanded list)

EU: Earth Warming Faster

<http://planetark.org/wen/52377>

World will not meet 2C warming target, climate change experts agree

<http://www.guardian.co.uk/environment/2009/apr/14/global-warming-target-2c>

Right to Survive

<http://www.oxfam.org/en/policy/right-to-survive-report>

Climate change will overload humanitarian system, warns Oxfam

<http://www.guardian.co.uk/environment/2009/apr/21/climate-change-natural-disasters>

The First G8 Agriculture Minister's Meeting

<http://www.g8agricultureministersmeeting.mipaaf.com/en/>

UN food agencies to join G8 agriculture ministers in Treviso

<http://www.fao.org/news/story/en/item/12094/icode/>

ESCAP website

<http://www.unescap.org/>

Theme Study 2009: Sustainable Agriculture and Food Security in Asia and the Pacific

http://www.unescap.org/65/theme_study2009.asp

International conference on gender and disaster risk reduction

<http://www.unisdr.org/english/events/v.php?id=8024>

‘21st Century multi-stakeholder partnership’ best way to mitigate growing scourge of disasters, build safer world, says Deputy Secretary-General in Beijing remarks

<http://www.un.org/News/Press/docs/2009/dsgsm454.doc.htm>

As World Warms, Water Levels Dropping In Major Rivers

<http://www.sciencedaily.com/releases/2009/04/090421101625.htm>

Climate change drying up big rivers, study finds

<http://www.alertnet.org/thenews/newsdesk/N21466356.htm>

Changes in Continental Freshwater Discharge from 1948–2004

<http://ams.allenpress.com/perlserv/?request=get-abstract&doi=10.1175/2008JCLI2592.1&ct=1>

Asia Must Tackle Water Security Threat – Report

<http://planetark.org/wen/52514>

Asia May See More Conflicts Over Water – Report

<http://planetark.org/wen/52478>

Asia's Next Challenge: Securing the Region's Water Future

<http://www.asiasociety.org/taskforces/water/>

Asia May See More Conflicts Over Water – Report

<http://planetark.org/wen/52478>

New ICESat Data Shows Arctic Ice Cap Thinning

<http://www.ens-newswire.com/ens/apr2009/2009-04-06-01.asp>

Satellite Data Shows Arctic On Thinner Ice

<http://planetark.org/wen/52352>

Lack Of Permanent Arctic Ice Surprises Explorers

<http://planetark.org/wen/52513>

Climate clock is ticking

<http://www2.canada.com/montrealgazette/news/saturdayextra/story.html?id=cdba2d64-0803-478a-8e26-7ba82f5596fe>

Antarctic Ice Shelf Disappears, Arctic Melting Rapidly

<http://www.ens-newswire.com/ens/apr2009/2009-04-03-01.asp>

Satellite imagery shows fragile Wilkins Ice Shelf destabilized

http://www.esa.int/esaCP/SEMRAVANJTF_index_0.html

Wordie Ice Shelf has disappeared: scientists

<http://www.reuters.com/article/environmentNews/idUSTRE5326HO20090403?sp=true>

Coastal-Change and Glaciological Map of the Larsen Ice Shelf Area, Antarctica: 1940–2005

<http://pubs.usgs.gov/imap/2600/B/>

New York City-Sized Ice Collapses Off Antarctica

<http://planetark.org/wen/52650>

Breakaway ice shelf will reshape map of Antarctic

<http://www.timesonline.co.uk/tol/news/environment/article6041360.ece>

World Health Day

<http://www.who.int/world-health-day/2009/en/index.html>

Living with climate change in Europe

http://ec.europa.eu/environment/climat/adaptation/index_en.htm

White paper - Adapting to climate change: towards a European framework for action
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0147:FIN:EN:HTML>
 Adapting to climate change: the European Union must prepare for the impacts to come
<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/519&format=HTML&aged=0&language=EN&guiLanguage=en>
 International conference on gender and disaster risk reduction
<http://www.unisdr.org/english/events/v.php?id=8024>
 ‘21st Century multi-stakeholder partnership’ best way to mitigate growing scourge of disasters, build safer world, says Deputy Secretary-General in Beijing remarks
<http://www.un.org/News/Press/docs/2009/dsgsm454.doc.htm>
 Latest round of UN talks on pact to combat global warming wraps up in Bonn
<http://www.un.org/apps/news/story.asp?NewsID=30433&Cr=climate&Cr1=change>
 Small Islands Urge Deep CO2 Cuts, Fear Rising Seas
<http://planetark.org/wen/52316>
 China, India reject climate agreement that obstructs economic growth
<http://mangalorean.com/news.php?newstype=local&newsid=119511>
 China considers setting targets for carbon emissions
<http://www.guardian.co.uk/world/2009/apr/19/china-environment-kyoto>

7.10 Nanotechnology Safety Issues

More detailed descriptions

7.10.1 EU Parliament Recommends Stronger Nanotech Precautions

Meridian Nanotechnology & Development News reports a Bureau of National Affairs story that the European Parliament has forwarded to the European Commission a resolution saying that current regulations are not sufficiently precautionary for handling nanomaterials. According to the story, it “has no legislative force, but must be considered by the European Commission when formulating EU policy on nanotechnology. The Commission's current approach to nanomaterials is that no major regulatory initiative is necessary.”

Military Implications:

Military in the European Theater should prepare themselves for the possibility of more stringent regulations in the future on the manufacture and use of nanomaterials.

Sources:

European Union Should Review Regulations Governing Nanomaterials, Parliament Says
<http://www.merid.org/NDN/more.php?id=1866>
 EU Parliament wants tighter nano regulation
<http://euobserver.com/9/28015/?rk=1>

7.10.2 New OECD Report on Nanotech Risks in the Workplace

The OECD has published a report, *Preliminary Analysis of Exposure Measurement and Exposure Mitigation in Occupational Settings: Manufactured Nanomaterials* that, “provides

researchers with suggestions on how to respond to the lack of standards on techniques for measuring workplace exposure to nanomaterials.” Further, “Researchers can still institute and develop standards on an individual basis, the report says, but recommends that consensus standards, biomarkers, and other tools and resources need to be developed.” The report also outlines the first part of an OECD project on this issue.

Military Implications:

Relevant military personnel should consider the report for input in establishing standards and safety procedures concerning nanotechnology manufacturing.

Sources:

OECD Addresses Shortfalls in Measuring Exposure to Nanomaterials in Workplace

<http://www.merid.org/NDN/more.php?id=1859>

Preliminary Analysis of Exposure Measurement and Exposure Mitigation in Occupational Settings: Manufactured Nanomaterials, report

[http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT000029E6/\\$FILE/JT03263204.PDF](http://www.oilis.oecd.org/oilis/2009doc.nsf/LinkTo/NT000029E6/$FILE/JT03263204.PDF)

7.10.3 SAFENANO Publishes First Global Review of EHS Risks of Nanotechnology

According to an article in Nanowerk News, Defra, the UK Government Department for Food & Rural Affairs, has published a report, *EMERGNANO: A review of completed and near completed environment, health and safety research on nanomaterials and nanotechnology*, from the SAFENANO initiative. “[The report] provides a unique identification and analysis of research carried out worldwide on nanotechnology safety, including that relating to hazard, exposure, risk assessment & regulation.” The article continues, “EMERGNANO identified more than 670 projects from around the world, and ... assessed more than 260 unique, relevant projects The final report provides a comprehensive listing of projects, alongside detailed evaluation of their outputs.” See also *UK Launches New Nanotechnology Environmental Service* in January 2008 environmental security report.]

Military Implications:

Relevant military personnel should consider the report for input concerning worldwide research and findings related to nanotechnology safety and therefore potential future standards and regulations.

Sources:

EMERGNANO: A review of completed and near completed environment, health and safety research on nanomaterials and nanotechnology report

http://www.safenano.org/Uploads/EMERGNANO_CB0409_Full.pdf

SAFENANO team completes global review of nanomaterial EHS research

<http://www.nanowerk.com/news/newsid=10088.php>

7.10.4 China Moves Strongly into Nanotech Arena

China has budgeted \$18 billion of its stimulus package for R/D this year, and the expectation is that a large piece of that will go into its sweeping nanotech program. A sign of this is that China now produces more papers on nanotech than any other country. A major concern in the future, of course, will be the safety of nanotech-containing Chinese exports.

Military Implications:

The military should closely follow the development of Chinese nanotech risk assessment and mitigation policy, and should consider working with the Chinese military on questions of the military's role in nanotech environmental health and safety issues.

Source:

China's giant step into nanotech

<http://www.guardian.co.uk/technology/2009/mar/26/nanotechnology-china>

7.10.5 New Comparison of Micro- and Nano-particles' Toxicity to Cells

Researchers in the Department of Plant, Soil and Insect Sciences at the Univ. of Massachusetts, led by Prof. Baoshan Xing, have published a new study showing that the size of oxide nanoparticles, in addition to their composition, is an important factor in their toxicity to bacteria, a characteristic with ecological implications.

Military Implications:

The military should follow this research in order to be able to take these factors into account in nanotech environmental risk assessments.

Sources:

Bacterial toxicity comparison between nano- and micro-scaled oxide particles

http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VB5-4VGW7M2-1&_user=10&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=b422b89cdc653ab8474130db850abf65

Size matters. Comparing the toxicity of micro- to nanoparticles

<http://www.nanowerk.com/spotlight/spotid=10128.php>

7.10.6 New Book Studies Media and Nanotechnology

Nanotechnology, Risk and Communication, co-authored by Professor Stuart Allan of Bournemouth University, United Kingdom [Palgrave Macmillan 2009], is "one of the first major studies of media coverage, policy debates and public perceptions about nanotechnology."

Military Implications:

Military personnel concerned with public communications should review this work for ideas on proper techniques for informing the populace about nanotechnology, particularly its risks.

Sources:

Nanotechnology, Risk and Communication

<http://www.palgrave.com/products/title.aspx?PID=277172>

7.10.7 International Nanotech Workshop to Precede June Prague Meeting

The 1st ICPC NanoNet Workshop will be held on June 1st, 2009, at the same venue as EuroNanoForum 2009, which begins on June 2nd. [See item *European Nanotech Meetings to Be Held in June and September 2009* in March 2009 environmental security report.] The Workshop will present reviews of nanotech activities from speakers representing all regions of the world.

Military Implications:

Military personnel in the European theater concerned with nanotechnology should consider attending these meetings, to learn of current developments in European nanotech and policy and to report back to relevant personnel in the U.S.

Source:

1st ICPC NanoNet Workshop

<http://www.icpc-nanonet.org/content/category/6/40/91/>